

## 4.4 Piecewise Functions

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

Find the indicated function values for each piecewise function.

$$1. \quad f(x) = \begin{cases} x, & \text{if } x < 0, \\ 2x+1, & \text{if } x \geq 0 \end{cases}$$

a)  $f(-5)$

b)  $f(0)$

c)  $f(10)$

$$2. \quad g(x) = \begin{cases} x-5, & \text{if } x \leq 5, \\ 3x, & \text{if } x > 5 \end{cases}$$

a)  $g(0)$

b)  $g(5)$

c)  $g(6)$

$$3. \quad f(x) = \begin{cases} x^2 - 10, & \text{if } x < -10, \\ x^2, & \text{if } -10 \leq x \leq 10, \\ x^2 + 10, & \text{if } x > 10 \end{cases}$$

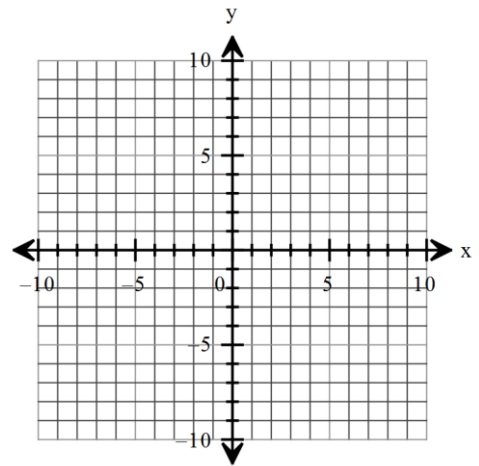
a)  $f(-10)$

b)  $f(10)$

c)  $f(11)$

Sketch the graph of each function. Be sure to label three points on the graph.

$$4. f(x) = \begin{cases} x^2, & \text{if } x < 0, \\ 2, & \text{if } x = 0, \\ 2x+1, & \text{if } x > 0 \end{cases}$$

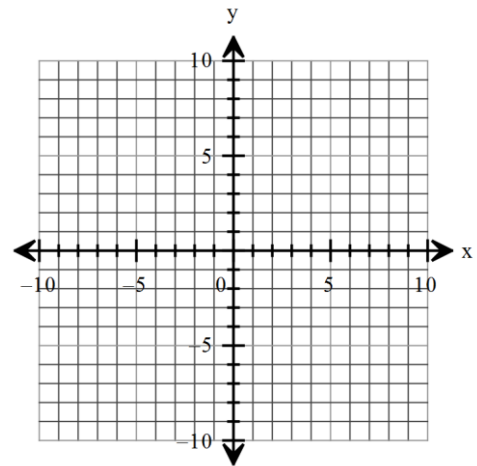


Find: a)  $f(-2)$

b)  $f(0)$

c)  $f(2)$

$$5. f(x) = \begin{cases} 2x-4, & \text{if } -1 \leq x \leq 2, \\ x^3-2, & \text{if } 2 < x \leq 3 \end{cases}$$



Find:

a)  $f(0)$

b)  $f(1)$

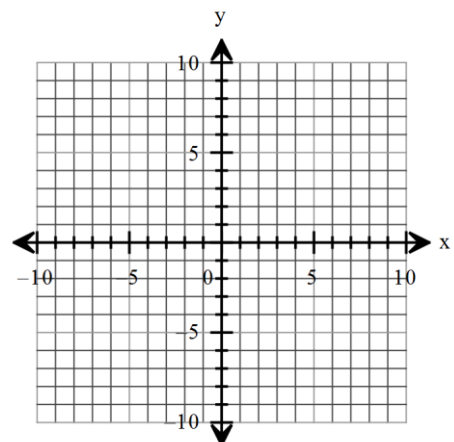
c)  $f(2)$

d)  $f(3)$

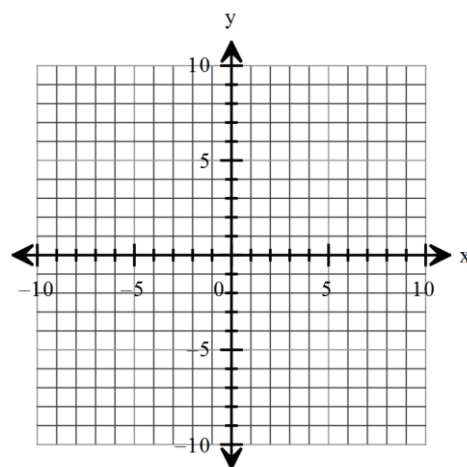
In problems 6-9:

a) Find the domain of each function. b) Locate any intercepts. c) Graph each function. d) Based on the graph, find the range.

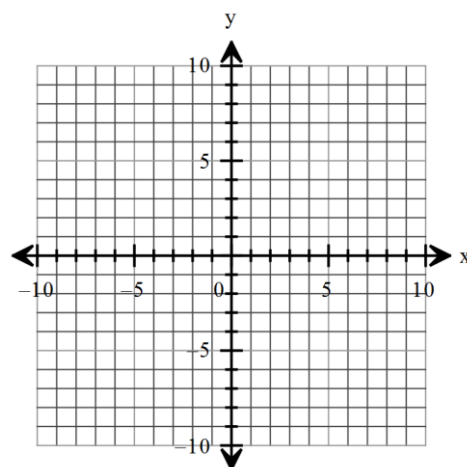
$$6. f(x) = \begin{cases} 2x, & \text{if } x \neq 0, \\ 1, & \text{if } x = 0 \end{cases}$$



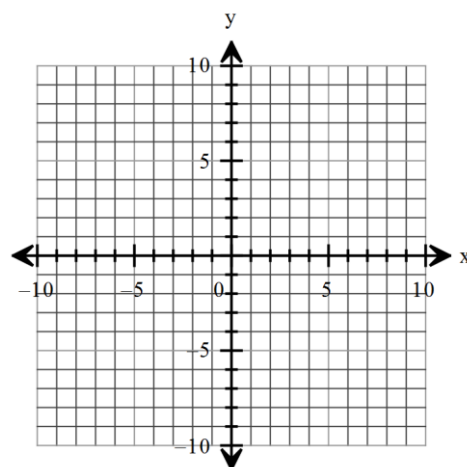
$$7. f(x) = \begin{cases} x+3, & \text{if } -2 \leq x < 1, \\ 5, & \text{if } x=1, \\ -x+2, & \text{if } x > 1 \end{cases}$$



$$8. f(x) = \begin{cases} 1+x, & \text{if } x < 0, \\ x^2, & \text{if } x \geq 0 \end{cases}$$

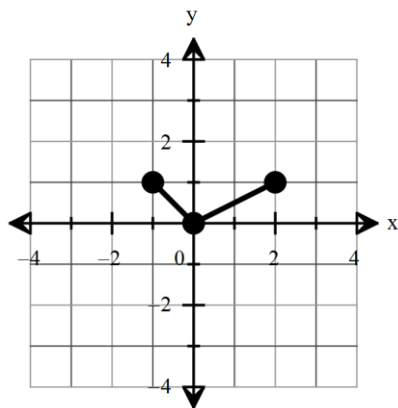


$$9. f(x) = \begin{cases} |x|, & \text{if } -2 \leq x < 0, \\ x^3, & \text{if } x > 0 \end{cases}$$

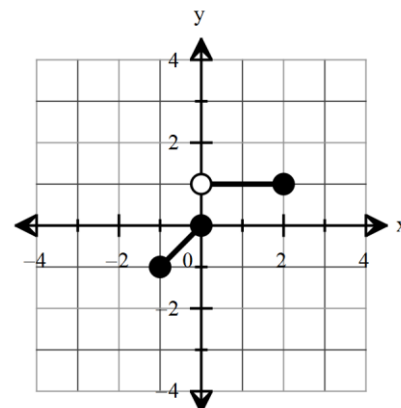


The graph of a piecewise function is given. Write a definition for each function.

10.



11.



## Review

## Solve

12.  $5 - 2\sqrt{x} = 3$

13.  $-\sqrt[3]{x} + 3 = 0$

14.  $(x+3)^{\frac{1}{2}} - 1 = x$

15.  $2(x-1)^{\frac{4}{3}} + 4 = 36$